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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,922	06/29/2006	Carlo Bacciottini	0341-034	2369
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EXAMINER				
PRAGER, JESSE M				
ART UNIT		PAPER NUMBER		
3745				
NOTIFICATION DATE		DELIVERY MODE		
10/01/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/596,922

Applicant(s)

BACCIOTTINI, CARLO

Examiner

JESSE PRAGER

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/20/09.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-9 and 11-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, and 11-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/13/07 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This is responsive to the communication filed 7/20/2009. Claims 1-5, 7-9 and 11-22 are pending in the present application. Claims 1-5 and 7-9 have been amended, Claims 6 and 10 have been cancelled, and Claims 11-22 have been added.

Response to Amendment

The follow specification amendments are accepted:

pg. 4, lines 21-24 changing the reference number of the base collar from 24 to 30;

pg. 6, lines 2-5 adding reference number 48; and

pg. 7, lines 20-23 adding reference number 82.

Response to Arguments

1. Applicant's arguments with respect to claims 1-5, and 7-9 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5, 7-9 and 11-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the claims 1 and 14, the claim limitation of “the axis of the slot being radial from an axial direction of the disk” is not clear. The claim limitation may be interpreted to mean at least that either that the axis of the slot **is tilted** radial from the axial direction of the disk, or **is positioned** radially outwards relative to the central axis pass-through hole. The claims have been rejected with the first interpretation that “being radial” refers to the axis being tilted radial from the axial direction of the disk. Claims 2-5, 7-9, 11-13 and 15-22 are indefinite by virtue of their dependence from either claim 1 or 14.

4. Claims 11 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim limitation of the slots being tilted “vertically” is not clear since the vertical direction is not clearly defined. It appears that “vertically” should be placed by “radially”.

Claim Rejections - 35 USC § 103

5. Claims 1-5, 7-9, 11-13, as far as they are definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannava (US Patent 5,522,706), in view of Nagaoka (JP 57-193701), and in further view of Walker et al. (US Patent 6,106,233).

In regards to claim 1, Mannava discloses a disk of a disk rotor for a gas turbine (Fig. 1) comprising:

- a central portion having a central axis pass-through hole (6);
- an intermediate portion (8) disposed around the central portion; and

an outer portion (10) disposed around the intermediate portion, the outer portion having a series of axial pass-through holes (18) configured to receive a series of tie rods and having a series of slots (54) configured to house corresponding series of vanes (14) wherein

the series of holes is positioned in the outer portion of the disk so as to obtain high dynamic characteristics of the rotor and at the same time a sufficient useful life thereof, and

each slot has a reference point for placing a corresponding vane, an angle between the reference point of a slot and a central point of adjacent hole of the series of holes, and the reference point is defined by an intersection of (i) of an axis of the slot in a middle side section of the disk with (ii) an extension of a side surface of the outer portion (Fig. F1).

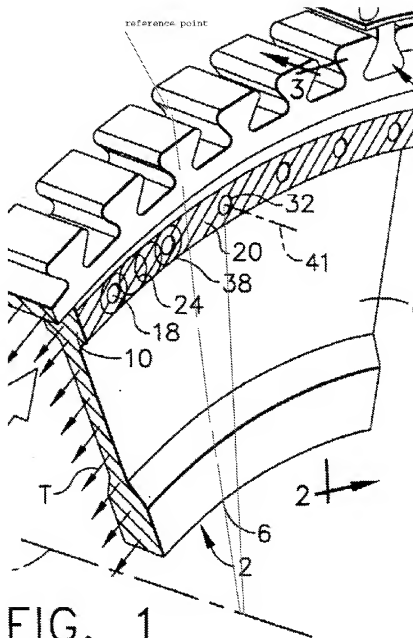


Figure F1: Mannava discloses the reference point and angle in between reference point and axial hole

In regards to the functional claim limitation that the position of the holes in the disk obtains high dynamic characteristics of the rotor and at the same time a sufficient useful life thereof, it follows based on the similarities in the structure of Mannava, with the placement of

the holes relative to the vanes, that the disk rotor obtains a high dynamic characteristic and a sufficiently useful life.

In regards to claim 1, Mannava lacks a first collar situated at a first end and a second collar situated at a second end of the central portion.

Nagaoka discloses a first collar situated at a first end and a second collar situated at a second end of the central portion (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the disk of Mannava, with the first collar situated at a first end and a second collar situated at a second end of the central portion as taught by Nagaoka, to create a friction locking connection in between disks which limits relative movement and sliding in between disks of the rotor.

In regards to claim 1, the modified Mannava disk lacks the axis of the slot being radial from an axial direction of the disk.

Walker et al. discloses slots being radial from an axial direction of the disk (Fig. 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the disk of Mannava with the axis of the slots being radial from an axial direction of the disk, as taught by Walker et al., because the absence of an extending root and a blade platform results in a blade that is lighter than a conventional blade (Col. 1, lines 37-42).

In regards to claim 1, Mannava teaches the angle in between the reference point and the central position of the adjacent hole. Mannava does not teach the specific dimension of the angle.

Since applicant has not disclosed that having the specific dimension of the angle solves any stated problem or is for any particular purpose above the fact that the angle or relative position relates reduces the stress concentration and it appears that the disk of Mannava would perform equally well with a shape and having the dimensions as claimed by applicant, it would have been an obvious matter of design choice to further modify the disk of Mannava by utilizing the specific shape and dimensions as claimed for the purpose of reducing stress concentrations.

In regards to claim 2, the modified disk of Mannava contains the series of holes on a base surface of the outer portion (Fig. 1).

In regards to claim 3, the modified disk of Mannava contains holes of the series of holes are positioned at an equal distance from each other along a circumference lying on the base surface the circumference being coaxial with the axial direction of the disk (Fig. 1).

In regards to claim 4, the modified disk of Mannava discloses all claim limitations, except the first collar comprises a bevel and a relief and the second collar comprises a bevel and a relief.

Nagaoka discloses a first collar comprises a bevel and a relief, and a second collar comprises a bevel and a relief (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the disk of Mannava, with a first collar comprises a bevel and a relief, and a second collar comprises a bevel and a relief as taught by Nagaoka, to create a friction locking connection in between disks which limits relative movement and sliding in between disks of the rotor.

In regards to claim 5, the modified disk of Mannava contains the disk has a total number of holes of the series of holes which is equal to the total number of slots of the series of slots for the series of vanes (Fig. 1).

In regards to claim 7, Mannava teaches the angle in between the reference point and the central position of the adjacent hole. Mannava does not teach the specific dimension of the angle.

Since applicant has not disclosed that having the specific dimension of the angle solves any stated problem or is for any particular purpose above the fact that the angle or relative position relates reduces the stress concentration and it appears that the disk of Mannava would perform equally well with a shape and having the dimensions as claimed by applicant, it would have been an obvious matter of design choice to further modify the disk of Mannava by utilizing the specific shape and dimensions as claimed for the purpose of reducing stress concentrations.

In regards to claim 8, the modified disk of Mannava contains the diameter of the circumference is close to the diameter of the disk (Fig. 1).

In regards to claim 9, Mannava discloses a disk rotor for a compressor (Col. 4, line 40) and a series of vanes, however lacks a series of disks, and a series of tie rods.

Nagaoka discloses a rotor disk comprising a series of disks and also comprising a series of tie rods, and a series of vanes (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the disk of Mannava to be in a series of disks with a series of tie rods, as taught by Nagaoka because as one of ordinary skill in the art would have known combining multiple disks to form a compressor disk rotor enables a multistage compressor which improves the efficiency of the compressor.

In regards to claim 11, the modified Mannava disk does not disclose each slot of the series of the slots is tilted both axially and vertically relative to axial and vertical directions of the disk.

Walker et al. discloses each slot of the series of the slots is tilted both axially and vertically relative to axial and vertical directions of the disk (Fig. 3).

It would have been obvious to further modify the disk of Mannava such that the slots is tilted both axially and vertically relative to axial and vertical directions of the disk as taught by Walker et al., because the absence of an extending root and a blade platform results in a blade that is lighter than a conventional blade (Col. 1, lines 37-42).

In regards to claim 12, the modified disk of Mannava further comprises the series of vanes, wherein a center of each vane is place to coincide with the reference point of a corresponding slot, as shown in Fig. 2 with the vane being centered in the slot.

In regards to claim 13, the modified disk of disk rotor of Mannava as applied to claim 1, extends along an axis within a corresponding slot that is different from the axial direction.

6. Claims 14-17, and 21-22, as far as they are definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannava, in view of Walker et al.

In regards to claim 14, Mannava discloses a disk of a disk rotor for a gas turbine (Fig. 1) comprising:

a central portion having a central axis pass-through hole (6);

an intermediate portion (8) disposed around the central portion; and

an outer portion (10) disposed around the intermediate portion, the outer portion having a series of axial pass-through holes (18) configured to receive a series of tie rods and having a series of slots (54) configured to house corresponding series of vanes (14) wherein

the series of holes is positioned in the outer portion of the disk so as to obtain high dynamic characteristics of the rotor and at the same time a sufficient useful life thereof, and

each slot has a reference point for placing a corresponding vane, an angle between the reference point of a slot and a central point of adjacent hole of the series of holes, and the reference point is defined by an intersection of (i) of an axis of the slot in a middle side section of the disk with (ii) an extension of a side surface of the outer portion (Fig. F1).

Mannava lacks the axis of the slots being radial from an axial direction of the disk.

Walker et al. discloses slots being radial from an axial direction of the disk (Fig. 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the disk of Mannava with the axis of the slots being radial from an axial direction of the disk, as taught by Walker et al., because the absence of an extending root and a blade platform results in a blade that is lighter than a conventional blade (Col. 1, lines 37-42).

In regards to claim 15, the modified Mannava disk does not disclose each slot of the series of the slots is tilted both axially and vertically relative to axial and vertical directions of the disk.

Walker et al. discloses each slot of the series of the slots is tilted both axially and vertically relative to axial and vertical directions of the disk (Fig. 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the disk of Mannava such that the slots is tilted both axially and vertically relative to axial and vertical directions of the disk as taught by Walker et al., because the absence of an extending root and a blade platform results in a blade that is lighter than a conventional blade (Col. 1, lines 37-42).

In regards to claim 16, the modified disk of a disk rotor of the further comprises a series of vanes (14) configured to be attached to the series of slots (54).

In regards to claim 17, the modified disk of a disk rotor comprises a center of each vane is placed to coincide with the reference point of each slot, as taught by Mannava in Fig. 2 by the centered position of the vane.

In regards to claim 21, the modified disk of a disk rotor of Mannava, comprises the disk is part of a gas turbine (Mannava Col. 1, line 30).

In regards to claim 22, the modified disk of a disk rotor or Mannava, comprises a series of vanes, wherein each vane extends along an axis within a corresponding slot that is different from the axial direction.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannava, in view of Walker et al. as applied to claim 14 above, and in further view of Nagaoka.

The modified disk of a disk rotor of Mannava includes all of the claimed limitations including, the central portion further comprising a central axis pass-through hole, however the modified disk of a disk rotor lacks

a first collar situated at a first end of the central portion; and a second collar situated at a second end of the central portion;

a diameter of the first collar is smaller than a diameter of the second collar; and
the first collar fits inside the second collar.

Nagaoka discloses a first collar at a first end of the central portion, a second collar situated at a second end of the central portion, a diameter of the first collar is smaller than a diameter of the second collar; and the first collar fits inside the second collar (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the disk of Mannava, with the first collar situated at a first end and a second collar situated at a second end of the central portion with the first collar having a smaller diameter and fitting within the second collar which has a larger diameter as taught by Nagaoka, to create a friction locking connection in between disks which limits relative movement and sliding in between disks of the rotor.

Conclusion

Applicant's amendment ("slot being radial from an axial direction of the disk") necessitated the new ground(s) of rejection presented in this Office action.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE PRAGER whose telephone number is (571)270-1412. The examiner can normally be reached on Monday-Friday, 9:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571)272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JESSE PRAGER/
Examiner, Art Unit 3745

9/25/2009

/Edward K. Look/
Supervisory Patent Examiner, Art Unit 3745